QC ABSTRACT

NAME OF WORK: Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)

SL NO	Item Of Work	Name of Test	Frequency of Test/Quantity	Executed Quantity	Number of Tests Required	Number of Tests Conducted
		Materials				
1	Cement	Fineness by dry sieving	One Test		1	1
		Finess by Air permeablity method	One Test		1	1
		Density	One Test		1	1
		Standard Consistency	One Test		1	1
		Initial Setting time	One Test		1	1
		Final Setting time	One Test		1	1
		Soundness (Le Chatelier's Method)	One Test		1	1
		Compressive Strength	One Test		1	1
2	Coarse aggregate(40 mm down size)	SIEVE ANALYSIS	One Test		1	1
		Flakiness Index	One Test		1	1
		Elongation Index	One Test		1	1
		Specific Gravity	One Test		1	1
		Bulk Density(Loose)	One Test		1	1
		Bulk Density(Compacted)	One Test		1	1
		Water Absorption	One Test		1	1
3	Coarse aggregate(20 mm down size)	SIEVE ANALYSIS	One Test		1	1
		Flakiness Index	One Test		1	1
		Elongation Index	One Test		1	1
		Specific Gravity	One Test		1	1
		Bulk Density(Loose)	One Test		1	1
		Bulk Density(Compacted)	One Test		1	1
		Water Absorption	One Test		1	1
		Aggregate crushing Value	One Test		1	1
		Aggregate Impact Value	One Test		1	1
4	Fine aggregate	SIEVE ANALYSIS	One Test		1	1
		Water Absorption	One Test		1	1
		Specific Gravity	One Test		1	1
		Material finer than 75 micron	One Test		1	1
5	Block(400*150*200)	BLOCK DENSITY	One Test		1	1
		WATER ABSORPTION	One Test		1	1
		DIMENSION ANALYSIS	One Test		1	1
		COMPRESSIVE STRENGTH	One Test		1	1
6	KERB	Core Compressive strength	One Test		1	1
		Corrected Cylinder Compressive strength	One Test		1	1
		Equivalent Cube Compressive strength	One Test		1	1

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7	Precast (100mm)	Core Compressive Strength	One Test		1	1
		Corrected Cylinder Compressive Strength	One Test		1	1
		Equivalent Cube Compressive Strength	One Test		1	1
8	PCC(M15)	Compressive Strength(7days and 28days)	5 set /50-100 cum	58.4	10	10
9	WMM	Sieve Analysis	One Test		1	1
		Impact Value	One Test		1	1
		Flakiness Index	One Test		1	1
		Elongation Index	One Test		1	1
10	DBM	SIEVE ANALYSIS	One Test		1	1
		STRIPPING VALUE	One Test		1	1
		Flakiness Index	One Test		1	1
		Elongation Index	One Test		1	1
		IMPACT VALUE	One Test		1	1
		Specific gravity	One Test		1	1
		Water Absorption	One Test		1	1
		Marshal Stability	One Test		1	1
		Marshal flow	One Test		1	1
		Percent air Voids	One Test		1	1
		Percent Voids in mineral Aggregate	One Test		1	1
		Percent Voids filled with Bitumen	One Test		1	1
		Density	One Test		1	1
		Gradation	One Test		1	1
11	BC	SIEVE ANALYSIS	One Test		1	1
		STRIPPING VALUE	One Test		1	1
		Flakiness Index	One Test		1	1
		Elongation Index	One Test		1	1
		IMPACT VALUE	One Test		1	1
		Specific gravity	One Test		1	1
		Water Absorption	One Test		1	1
		Marshal Stability	One Test		1	1
		Marshal flow	One Test		1	1
		Percent air Voids	One Test		1	1
		Percent Voids in mineral	One Test		1	1
		Percent Voids filled with Bitumen	One Test		1	1
		Density	One Test		1	1
		Gradation	One Test		1	1
12	BITUMEN	Ductility	One Test		1	1
		Softening Point	One Test		1	1
		Penetration	One Test		1	1
		Flash Point	One Test		1	1
		Fire Point	One Test		1	1
13	TACK COAT	Rate of spread	One Test		1	1

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Format No: CP/TF/01

TEST REPORT OF PHYSICAL PROPERTIES OF CEMENT - 53 Grade

Lab ID	:	**CP-2022-01-29-38** **Date: 06-05-21**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore
Project Name	:	Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)
Agency	:	Sri N M Shivakumar, No 7,2nd Block, Juganahalli, Rajajinagara, Bangalore-560010
Customer's Reference	:	BBMP/EE/BTP/WO/204/2020-21
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	03-05-21
Sample Type	:	Birla Super 53grade
Reference to BIS codes	:	IS 12269 : 2013, 53 Grade Ordinary Portland cement Specification , IS 4031 (Part 1,2 3,4,5, 6,11) 1988 IS 4031 Part 1 DETERMINATION OF FINENESS BY DRY SIEVING, Clause 4 4 IS 4031 Part 2, Determination of Fineness by Blaine Air Permeability Method, Clause 5 IS 4031 Part 3, Determination of Soundness, Clause 5,Clause 6 IS 4031 Part 4, Determination of Consistency of Standard Cement Paste, Clause 5 IS 4031 Part 5, Determination of Initial & Final Setting Time, Clause 5 IS 4031 Part 11,DETERMINATION OF DENSITY , Clause 6
Date of test	:	04-05-21
Environmental Conditions during test	:	Temperature: 26°C Humidity: 72%

Sl.No.	Physical properties	Results	Requirement as per IS 12269: 2013
1	Fineness by dry sieving (%)	1.28	_
2	Finess by Air permeablity method (m^2/kg,Min)	281.5	225m^2/kg, Min
3	Density (gm/cc)	3.14	_
4	Standard Consistency (%)	29.0%	Not specified
5	Initial Setting time	165 minutes	Not less than 30 minutes
6	Final Setting time	285 minutes	Not more than 600 minutes
7	Soundness (Le Chatelier's Method)	1.5mm	Not more than 10 mm

* The results obtained are satisfactory as per standard requirements.

Note:

The results pertain to the samples received and tested.

All information furnished by Customer/Representative

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Authorized Signatory
Quality Manager

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TEST REPORT OF PHYSICAL PROPERTIES OF CEMENT - 53 Grade

Lab ID	:	**CP-2022-01-29-38** **Date: 01-06-21**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)
Agency	:	Sri.N M Shivakumar, No.7,2nd Block, Juganahalli, Rajajinagara, Bangalore-560010
Customer's Reference	:	BBMP/EE/BTP/WO/204/2020-21
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	03-05-21
Sample Type	:	Birla Super 53grade
Reference to BIS codes	:	IS 12269 : 2013, 53 Grade Ordinary Portland cement Specification , IS 4031 Part 4, Determination of Consistency of Standard Cement Paste, Clause 5 IS 4031 Part 6, Determination of Compressive Strength, Clause 6
Date of test	:	04-05-21
Environmental Conditions during test	:	Temperature: 26°C Humidity: 72%

Compressive Strength

Sl.No.	Physical properties	Results	Requirement as per IS 12269: 2013
1	3 Days	29.5N/mm^2	Not less than 27 N/mm^2
2	7 Days	38.5N/mm^2	Not less than 37 N/mm^2
3	28 Days	55.5N/mm^2	Not less than 53 N/mm^2

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TEST REPORT ON COARSE AGGREGATES

Lab ID	:	**CP-2022-01-29-38** **Date: 06-05-21**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09
Agency	:	Sri.N M Shivakumar, No.7,2nd Block, Juganahalli, Rajajinagara. Bangalore-560010
Customer's Reference	:	BBMP/EE/BTP/WO/204/2020-21
Source of Sample	:	Sample supplied by Agency
Sample condition	:	Satisfactory
Date of Receipt	:	03-05-21
Sample Type	:	40mm down size coarse aggregate
Reference to BIS codes	:	IS: 383:2016 (Specification for Coarse and fine Aggregates) IS: 2386 :1963(Part - 1,3,4) RA2011 IS 2386 Part 1: Particle Size and Shape IS 2386 Part 3: Specific gravity, Density, Voids,Water Absorption IS 2386 Part 4: Mechanical Properties
Date of test	:	03-05-21

SIEVE ANALYSIS (PARTICLE SIZE DISTRIBUTION) OF 40MM DOWN COARSE AGGREGATE:

Total weight taken : 15000 grams

Sample No.	Sieve No.	Weight Retained in gms	Cumulative Weight Retained in gms	% Cumulative Weight Retained	% Passing	Required as per IS 383:2016
1	80 mm	0	0	0.0	100	100
2	40 mm	234	234	1.6	98.4	90-100
3	20 mm	4278	4512	30.1	69.9	30-70
4	10 mm	5961	10473	69.8	30.2	10-35
5	4.75 mm	4281	14754	98.4	1.6	0-5
6	Pan	246	15000	100.0	0	---

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TEST REPORT ON COARSE AGGREGATES

Lab ID : **CP-2022-01-29-38** **Date: 06-05-21**

PHYSICAL PROPERTIES

Sl.no	Tests	Result	Requirements as per IS:383-2016
1	Flakiness Index(%)	14.2	Combined Flakiness & Elongation Index Shall not Exceed 40% for Uncrushed & Crushed Aggregate
2	Elongation Index(%)	11.7	
3	Specific Gravity	2.63	_
4	Bulk Density(Loose) (Kg/l)	1.49	_
5	Bulk Density(Compacted) (Kg/l)	1.55	_
6	Water Absorption(%)	0.21	_

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TEST REPORT ON COARSE AGGREGATES

Lab ID	:	**CP-2022-01-29-38** **Date: 05-05-21**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)
Agency	:	Sri.N M Shivakumar, No.7,2nd Block, Juganahalli, Rajajinagara, Bangalore-560010
Customer Reference	:	BBMP/EE/BTP/WO/204/2020-21
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	03-05-21
Sample Type/ Size	:	20mm down size coarse aggregate
Reference to BIS codes	:	IS: 383:2016 (Specification for Coarse and fine Aggregates) IS: 2386 :1963(Part - 1,3,4) RA2011 IS 2386 Part 1: Particle Size and Shape IS 2386 Part 3: Specific gravity, Density, Voids,Water Absorption IS 2386 Part 4: Mechanical Properties
Date of test	:	03-05-21

SIEVE ANALYSIS (PARTICLE SIZE DISTRIBUTION) OF 20MM DOWN COARSE AGGREGATE:

Total weight taken : 5000 grams

Sample No.	Sieve No.	Weight Retained in gms	Cumulative Weight Retained in gms	% Cumulative Weight Retained	% Passing	Required as per IS 383:2016
1	40 mm	0	0	0	100	100
2	20 mm	185	185	3.7	96.3	90-100
3	10 mm	3117	3302	66.0	34.0	25-55
4	4.75 mm	1581	4883	97.7	2.3	0-10
5	Pan	117	5000	100	0	_

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M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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TEST REPORT ON COARSE AGGREGATES

Lab ID : **CP-2022-01-29-38** **Date: 05-05-21**

PHYSICAL PROPERTIES

Sl.no	Tests	Result	Requirements as per IS:383-2016
1	Flakiness Index(%)	10.9	Combined Flakiness & Elongation Index Shall not Exceed 40% for Uncrushed & Crushed Aggregate
2	Elongation Index(%)	11.5	
3	Specific Gravity	2.63	_
4	Bulk Density(Loose) (Kg/l)	1.51	_
5	Bulk Density(Compacted) (Kg/l)	1.56	_
6	Water Absorption(%)	0.19	_
7	Aggregate crushing Value(%)	23.1	Max 30% for Aggregates to be used in concrete for wearing Surface, In case Aggregate Crushing Value Exceeds 30% then the test for ten percent fines should be conducted for Aggregates to be used in concrete other than for wearing Surface.
8	Aggregate Impact Value(%)	22.8	30% for Aggregates to be used in concrete for wearing Surface, 45% for Aggregates to be used in concrete other than for wearing Surface.

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Authorized Signature
Quality Manager

M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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TEST REPORT OF FINE AGGREGATE

Lab ID : **CP-2022-01-29-38** **Date: 05-05-21**

Customer : Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.

Address : Vidyaranyapura Sub Division, BBMP, Bangalore.

Project Name : Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)

Agency : Sri.N M Shivakumar, No.7,2nd Block, Juganahalli, Rajajinagara, Bangalore-560010

Customer's Reference : BBMP/EE/BTP/WO/204/2020-21

Source of Sample : Sample supplied by Agency

Sample Condition : Satisfactory

Date of Receipt : 03-05-21

Sample Type : Fine Aggregate

Reference to BIS codes : IS 383 : 2016 (Specification for Coarse and fine Aggregates)
IS: 2386 :1963(Part - 1, 3) RA2012
IS 2386 Part 1: Particle Size and Shape
IS 2386 Part 3: Specific gravity, Density, Voids,Water Absorption

Date of test : 03-05-21

Total weight taken : 1000 grams

Sl.no	Sieve Size	Weight Retained (gms)	Cumulative Weight Retained (gms)	% Cumulative Weight Retained	% Passing	Requirement as per IS 383:2016			
						Grading Zone I	Grading Zone II	Grading Zone III	Grading Zone IV
1	10 mm	0	0	0.0	100.0	100	100	100	100
2	4.75 mm	84	84	8.4	91.6	90-100	90-100	90-100	95-100
3	2.36 mm	145	229	22.9	77.1	60-95	75-100	85-100	95-100
4	1.18 mm	208	437	43.7	56.3	30-70	55-90	75-100	90-100
5	600 micron	135	572	57.2	42.8	15-34	35-59	60-79	80-100
6	300 micron	189	761	76.1	23.9	5-20	8-30	12-40	15-50
7	150 micron	153	914	91.4	8.6	0-10	0-10	0-10	0-15
8	Pan	86	1000	100.0	0.0	---	---	---	---

Result :The tested Sample Conforms to Grading Zone II

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TEST REPORT OF FINE AGGREGATE

Lab ID : **CP-2022-01-29-38** **Date: 05-05-21**

PHYSICAL PROPERTIES

Sl.no	Tests	Result	Requirements as per IS 383:2016
1	Water Absorption(%)	1.24	_
2	Specific Gravity	2.53	_
3	Material finer than 75 micron(%)	7.2	Uncrushed fine Aggregate Max 3%, Crushed Fine aggregate Max 15%, Mixed Fine aggregate Max 12%, Manufactured Fine aggregate Max 10%

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TEST REPORT OF PRECAST COVER SLAB

Lab ID	:	**CP-2022-01-29-38** **Date: 08-05-21**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)
Agency	:	Sri.N M Shivakumar, No.7,2nd Block, Juganahalli, Rajajinagara, Bangalore-560010
Customer's Reference	:	BBMP/EE/BTP/WO/204/2020-21
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	03-05-21
Sample Type /Size	:	Precast Cover Slab
Reference to BIS codes	:	IS: 516 - 1959 Methods of Tests for Strength of Concrete
Date of test	:	04/05/2021

Sl. No.	Identification Mark	Diameter of the core	Height of the core	Weight of the core	Area	Failure Load	Core Compressive strength	Corrected Cylinder Compressive strength	Equivalent Cube Compressive strength
		(mm)	(mm)	(kg)	(Sq.mm)	(KN)	(N/mm^2)	(N/mm^2)	(N/mm^2)
1	Cover Slab-1	75.18	100.49	1.342	4438	83.7	18.9	17.5	21.9
2	Cover Slab-2	75.15	100.52	1.372	4435	81.4	18.4	17.1	21.3
3	Cover Slab-3	75.23	100.52	1.399	4444	85.1	19.1	17.8	22.3

* The results obtained are satisfactory as per standard requirements.

Note:

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TEST REPORT OF CEMENT CONCRETE KERB STONE

Lab ID	:	**CP-2022-01-29-38**	**Date: 08-05-21**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.	
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.	
Project Name	:	Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)	
Agency	:	Sri.N M Shivakumar, No.7,2nd Block, Juganahalli, Rajajinagara, Bangalore-560010	
Customer's Reference	:	BBMP/EE/BTP/WO/204/2020-21	
Source of Sample	:	Sample supplied by Agency	
Sample Condition	:	Satisfactory	
Date of Receipt	:	03-05-21	
Sample Type /Size	:	CC Kerb Stone/ 450*165*400mm	
Reference to BIS codes	:	IS: 516 - 1959 Methods of Tests for Strength of Concrete	
Date of test	:	04/05/2021	

Sl. No.	Identification Mark	Diameter of the core	Height of the core	Weight of the core	Area	Failure Load	Core Compressive strength	Corrected Cylinder Compressive strength	Equivalent Cube Compressive strength
		(mm)	(mm)	Kg	(Sq.mm)	(KN)	(N/mm2)	(N/mm2)	(N/mm2)
1	A	100.02	165.51	2.917	7856	151.3	19.3	19.3	24.1
2	B	100.01	165.52	2.854	7854	154.8	19.7	19.7	24.6
3	C	100.02	165.49	2.842	7856	155.3	19.8	19.8	24.7

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TEST REPORT OF CEMENT CONCRETE CUBES

Lab ID : **CP-2022-01-29-38** **Date: 19/05/2021**

Customer : Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore

Address : Vidyaranyapura Sub Division, BBMP, Bangalore.

Project Name : Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)

Agency : Sri N M Shivakumar, No 7,2nd Block, Juganahalli, Rajajinagara, Bangalore-560010

Customer's Reference : BBMP/EE/BTP/WO/204/2020-21

Source of Sample : Sample supplied by Agency

Sample Condition : Satisfactory

Date of Receipt : 14-05-21

Customer ID : PCC

Sample Type /Size : 150X150X150 mm

Sample grade/Age : M15 / 7 Days Compressive Strength

Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5

Date of test : 19/05/2021

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	PCC	M15	12/05/2021	19/05/2021	151.07 X 151.25 X 150.26	22849	8.475	286.4	12.5	12.3
2	PCC	M15	12/05/2021	19/05/2021	149.89 X 149.76 X 150.37	22447	8.966	279.8	12.5	
3	PCC	M15	12/05/2021	19/05/2021	151.85 X 150.82 X 150.40	22903	8.506	275.5	12.0	

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R KARTHIK RECHAN
Authorized Signatory
Quality Manager

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M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

HIGHWAY & BUILDING MATERIALS TESTING LABORATORY | STRUCTURAL | ENVIRONMENTAL
WATER TESTING | GEO TECHNICAL | PROJECT MANAGEMENT | SURVEYING SERVICES

Format No: CP/TF/01

TEST REPORT OF CEMENT CONCRETE CUBES

Lab ID	:	**CP-2022-01-29-38** **Date: 09/06/2021**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore
Project Name	:	Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)
Agency	:	Sri N M Shivakumar, No 7,2nd Block, Juganahalli, Rajajinagara, Bangalore-560010
Customer's Reference	:	BBMP/EE/BTP/WO/204/2020-21
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	14-05-21
Customer ID	:	PCC
Sample Type /Size	:	150X150X150 mm
Sample grade/Age	:	M15 / 28 Days Compressive Strength
Reference to BIS codes	:	IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5
Date of test	:	09/06/2021

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	PCC	M15	12/05/2021	09/06/2021	151.06 X 149.26 X 149.61	22547	8.844	402.4	17.8	17.6
2	PCC	M15	12/05/2021	09/06/2021	149.72 X 151.65 X 149.99	22705	8.551	405.3	17.9	
3	PCC	M15	12/05/2021	09/06/2021	151.59 X 151.96 X 151.17	23035	9.066	391.8	17.0	

* The results obtained are satisfactory as per standard requirements.

Note:

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Authorized Signatory
Quality Manager

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****End of Report****

Format No: CP/TF/01

TEST REPORT ON PHYSICAL REQUIREMENTS OF SOLID CONCRETE BLOCKS

Lab ID	:	**CP-2022-01-29-38** **Date: 07-05-21**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore
Project Name	:	Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)
Agency	:	Sri N M Shivakumar, No 7,2nd Block, Juganahalli, Rajajinagara, Bangalore-560010
Customer's Reference	:	BBMP/EE/BTP/WO/204/2020-21
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	03-05-21
Sample Type/Size	:	Solid concrete blocks size (400X150X200)mm
Reference to BIS codes	:	IS : 2185 (Part 1) : 2005(RA 2010) Concrete Masonry Specification Part 1 Hollow and Solid Concrete Blocks (Dimensions -Annex-B, Clause 9.2 and 10 , Block density Annex - C Clause 9.3 and10, Compressive strength Annex -D Clause 9.4 and 10, Water absorption Annex -E Clause 9.5 and 10)
Date of test	:	03-05-21

BLOCK DENSITY:

Sl. No.	Measurement of overall Dimensions of Individual Blocks			Overall Volume of the Block in Cubic Centimetres	Weight of Oven Dried Block in Kilograms to the nearest 10 Gram	Block Density in Kg/cum*10^6	Avg.Block Density in (Kg/cum)	As per IS 2185(Part 1) :2005 (RA 2010)
	Length	Breadth	Height					
	mm	mm	mm	(Cm^3)	Kg	Kg/m^3	Kg/m^3	
1	400	153	198	12118	22.501	1856.8	1824.4	Not less than 1800Kg/m^3
2	399	151	202	12170	22.705	1865.6		
3	405	150	200	12150	21.273	1750.9		

WATER ABSORPTION:

Sl. No.	Wet weight after water absorption	Dry weight (Oven dry)	Water Absorption	Avg.Water Absorption	As per IS 2185(Part 1):2005 (RA 2010)
	kg	kg	%	%	
1	24.91	23.71	4.82	4.26	Shall not be more than 10% by mass
2	25.57	24.75	3.22		
3	24.44	23.28	4.75		

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Lab ID : **CP-2022-01-29-38** **Date: 07-05-21**

DIMENSION ANALYSIS

Sl.no	Length mm	Breadth mm	Height mm	Requirement as per IS 2185(Part 1):2005
1	401	153	202	**Length : ± 5mm** **Breadth : ± 3mm** **Height : ± 3mm**
2	403	151	201	
3	402	151	199	
4	402	150	201	
5	400	151	199	
6	403	149	201	
7	400	151	202	
8	400	152	200	
9	400	149	199	
10	401	150	200	
11	400	150	199	
12	400	151	203	
13	403	151	201	
14	402	151	201	
15	399	150	200	
16	401	150	202	
17	403	153	203	
18	403	151	199	
19	403	152	202	
20	403	152	202	
Average of 20	**401**	**151**	**201**	

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Lab ID : **CP-2022-01-29-38** **Date: 07-05-21**

COMPRESSIVE STRENGTH:

Sl. No.	Size of solid block		Area	Failure Load	Compressive strength	Average Compressive strength
	Length	Breadth				
	mm	mm	(mm^2)	(KN)	N/mm^2	(N/mm^2)
1	400	153	61187	254.0	4.2	4.2
2	403	151	60896	258.7	4.2	
3	402	151	60583	257.5	4.3	
4	402	150	60411	244.7	4.1	
5	400	151	60456	266.5	4.4	
6	403	149	60114	239.7	4.0	
7	400	151	60629	264.8	4.4	
8	400	152	60856	253.9	4.2	

As per IS Requirements (Table 2, Clause 5.1, 5.2 and 9.4)

Compressive strength		
Grade	**Minimum average**	**Minimum Individual units.**
C (5.0)	5.00 N/mm^2	4.00 N/mm^2
C (4.0)	4.00 N/mm^2	3.20 N/mm^2

* The Results Obtained are Satisfactory as per Standard Requirements

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R KARTHIK RECHAN
Authorized Signatory
Quality Manager

AEE (VRP) SD

****End of Report****

M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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Format No: CP/TF/01

TEST REPORT OF CEMENT CONCRETE CUBES

Lab ID : **CP-2022-01-29-38** **Date: 19/05/2021**

Customer : Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.

Address : Vidyaranyapura Sub Division, BBMP, Bangalore.

Project Name : Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)

Agency : Sri.N M Shivakumar, No.7,2nd Block, Juganahalli, Rajajinagara, Bangalore-560010

Customer's Reference : BBMP/EE/BTP/WO/204/2020-21

Source of Sample : Sample supplied by Agency

Sample Condition : Satisfactory

Date of Receipt : 14-05-21

Customer ID : PCC

Sample Type /Size : 150X150X150 mm

Sample grade/Age : M15 / 7 Days Compressive Strength

Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5

Date of test : 19/05/2021

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	PCC	M15	12/05/2021	19/05/2021	151.05 X 151.27 X 151.59	22849	8.157	290.8	12.7	12.6
2	PCC	M15	12/05/2021	19/05/2021	149.43 X 149.79 X 152.00	22383	8.678	285.5	12.8	
3	PCC	M15	12/05/2021	19/05/2021	150.38 X 151.13 X 151.47	22727	8.656	281.7	12.4	

* The results obtained are satisfactory as per standard requirements.

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Authorized Signatory
Quality Manager

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M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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TEST REPORT OF CEMENT CONCRETE CUBES

Lab ID : **CP-2022-01-29-38** **Date: 09/06/2021**

Customer : Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.

Address : Vidyaranyapura Sub Division, BBMP, Bangalore.

Project Name : Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)

Agency : Sri N M Shivakumar, No.7,2nd Block, Juganahalli, Rajajinagara, Bangalore-560010

Customer's Reference : BBMP/EE/BTP/WO/204/2020-21

Source of Sample : Sample supplied by Agency

Sample Condition : Satisfactory

Date of Receipt : 14-05-21

Customer ID : PCC

Sample Type /Size : 150X150X150 mm

Sample grade/Age : M15 / 28 Days Compressive Strength

Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5

Date of test : 09/06/2021

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen	Cross sectional area	Weight of the sample	Failure Load	Compressive strength	Average Compressive Strength
					(mm)	(Sq.mm)	(kg)	(KN)	(N/mm^2)	(N/mm^2)
1	PCC	M15	12/05/2021	09/06/2021	149.74 X 151.21 X 149.99	22641	8.468	398.4	17.6	17.5
2	PCC	M15	12/05/2021	09/06/2021	150.57 X 151.81 X 149.31	22859	8.640	395.8	17.3	
3	PCC	M15	12/05/2021	09/06/2021	149.82 X 151.81 X 150.71	22745	8.963	402.6	17.7	

* The results obtained are satisfactory as per standard requirements.

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Quality Manager

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Format No: CP/TF/01

TEST REPORT OF CEMENT CONCRETE CUBES

Lab ID : **CP-2022-01-29-38** **Date: 20/05/2021**

Customer : Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore

Address : Vidyaranyapura Sub Division, BBMP, Bangalore

Project Name : Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)

Agency : Sri N M Shivakumar, No 7,2nd Block, Juganahalli, Rajajinagara, Bangalore-560010

Customer's Reference : BBMP/EE/BTP/WO/204/2020-21

Source of Sample : Sample supplied by Agency

Sample Condition : Satisfactory

Date of Receipt : 15-05-21

Customer ID : PCC

Sample Type /Size : 150X150X150 mm

Sample grade/Age : M15 / 7 Days Compressive Strength

Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5

Date of test : 20/05/2021

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen	Cross sectional area	Weight of the sample	Failure Load	Compressive strength	Average Compressive Strength
					(mm)	(Sq.mm)	(kg)	(KN)	(N/mm^2)	(N/mm^2)
1	PCC	M15	13/05/2021	20/05/2021	150.87 X 149.85 X 149.59	22608	8.894	281.4	12.4	12.5
2	PCC	M15	13/05/2021	20/05/2021	151.99 X 150.14 X 149.30	22821	8.148	288.3	12.6	
3	PCC	M15	13/05/2021	20/05/2021	150.33 X 149.41 X 150.42	22461	8.116	279.7	12.5	

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R KARTHIK RECHAN
Authorized Signatory
Quality Manager

AEE (VRP)-BTP

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M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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Format No: CP/TF/01

TEST REPORT OF CEMENT CONCRETE CUBES

Lab ID : **CP-2022-01-29-38** **Date: 10/06/2021**

Customer : Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.

Address : Vidyaranyapura Sub Division, BBMP, Bangalore

Project Name : Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No.09 (Vidyaranyapura)

Agency : Sri.N.M.Shivakumar, No.7,2nd Block, Juganahalli, Rajajinagara, Bangalore-560010

Customer's Reference : BBMP/EE/BTP/WO/204/2020-21

Source of Sample : Sample supplied by Agency

Sample Condition : Satisfactory

Date of Receipt : 15-05-21

Customer ID : PCC

Sample Type /Size : 150X150X150 mm

Sample grade/Age : M15 / 28 Days Compressive Strength

Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5

Date of test : 10/06/2021

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	PCC	M15	13/05/2021	10/06/2021	149.76 X 150.29 X 150.41	22507	8.528	399.3	17.7	17.5
2	PCC	M15	13/05/2021	10/06/2021	151.24 X 151.23 X 150.05	22872	8.364	399.1	17.4	
3	PCC	M15	13/05/2021	10/06/2021	149.22 X 150.18 X 151.66	22409	8.810	389.3	17.4	

* The results obtained are satisfactory as per standard requirements.

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Quality Manager

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Format No: CP/TF/01

TEST REPORT OF CEMENT CONCRETE CUBES

Lab ID : CP-2022-01-24-38 Date: 20/05/2021

Customer : Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore

Address : Vidyaranyapura Sub Division, BBMP, Bangalore

Project Name : Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 24 (Vidyaranyapura)

Agency : Sri.N.M.Shivakumar, No 7,2nd Block, Jagannahalli, Rajajinagara, Bangalore-560010

Customer's Reference : BBMP/EE/BTP/W.O 214/2020-21

Source of Sample : Sample supplied by Agency

Sample Condition : Satisfactory

Date of Receipt : 15/05/21

Customer ID : PCC

Sample Type Size : 150X150X150 mm

Sample grade Age : M25 7 Days Compressive Strength

Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5

Date of test : 20/05/2021

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen	Cross sectional area	Weight of the sample	Failure Load	Compressive strength	Average Compressive Strength
					(mm)	(Sq.mm)	(kg)	(KN)	(N/mm^2)	(N/mm^2)
1	PCC	M25	13/05/2021	20/05/2021	150.96 X 150.41 X 150.58	22903	8.057	295.1	12.9	12.6
2	PCC	M25	13/05/2021	20/05/2021	150.61 X 151.78 X 151.23	22861	8.556	286.6	12.5	
3	PCC	M25	13/05/2021	20/05/2021	149.30 X 151.77 X 152.62	22658	8.78	278.4	12.4	

* The results obtained are satisfactory as per standard requirements.

Note:
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All information furnished by Customer Representative
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Quality Manager

Page 1 / 1
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Format No: CP/TF:01

TEST REPORT OF CEMENT CONCRETE CUBES

Lab ID : **CP-2022-01-29-38** **Date: 10/06/2021**

Customer : Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore

Address : Vidyaranyapura Sub Division, BBMP, Bangalore

Project Name : Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)

Agency : Sri N M Shivakumar, No 7,2nd Block, Juganahalli, Rajajinagara, Bangalore-560010

Customer's Reference : BBMP/EE/BTP/WO/204/2020-21

Source of Sample : Sample supplied by Agency

Sample Condition : Satisfactory

Date of Receipt : 15-05-21

Customer ID : PCC

Sample Type /Size : 150X150X150 mm

Sample grade/Age : M15 / 28 Days Compressive Strength

Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl 5

Date of test : 10/06/2021

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	PCC	M15	13/05/2021	10/06/2021	149.12 X 149.41 X 151.16	22281	8.352	381.5	17.1	17.3
2	PCC	M15	13/05/2021	10/06/2021	151.30 X 149.80 X 149.35	22665	8.148	395.9	17.5	
3	PCC	M15	13/05/2021	10/06/2021	151.68 X 149.48 X 151.38	22673	8.609	391.8	17.3	

* The results obtained are satisfactory as per standard requirements.

Note:

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Quality Manager

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M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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TEST REPORT OF CEMENT CONCRETE CUBES

Lab ID : **CP-2022-01-29-38** **Date: 21/05/2021**

Customer : Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore

Address : Vidyaranyapura Sub Division, BBMP, Bangalore

Project Name : Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)

Agency : Sri.N M Shivakumar, No 7,2nd Block, Juganahalli, Rajajinagara, Bangalore-560010

Customer's Reference : BBMP/EE/BTP/WO/204/2020-21

Source of Sample : Sample supplied by Agency

Sample Condition : Satisfactory

Date of Receipt : 17-05-21

Customer ID : PCC

Sample Type /Size : 150X150X150 mm

Sample grade/Age : M15 / 7 Days Compressive Strength

Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5

Date of test : 21/05/2021

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen	Cross sectional area	Weight of the sample	Failure Load	Compressive strength	Average Compressive Strength
					(mm)	(Sq.mm)	(kg)	(KN)	(N/mm^2)	(N/mm^2)
1	PCC	M15	14/05/2021	21/05/2021	151.46 X 151.60 X 149.82	22962	8.143	283.2	12.3	12.4
2	PCC	M15	14/05/2021	21/05/2021	150.86 X 151.31 X 151.66	22827	8.932	289.8	12.7	
3	PCC	M15	14/05/2021	21/05/2021	150.85 X 149.94 X 149.17	22619	8.280	271.9	12.0	

* The results obtained are satisfactory as per standard requirements.

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Authorized Signatory
Quality Manager

AEE (VRP) SD

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M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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Format No. CP/TF.01

TEST REPORT OF CEMENT CONCRETE CUBES

Date: 11/06/2021

Lab ID	:	**CP-2022-01-29-38**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore
Project Name	:	Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)
Agency	:	Sri N M Shivakumar, No 7,2nd Block, Juganahalli, Rajajinagara, Bangalore-560010
Customer's Reference	:	BBMP/EE/BTP/WO/204/2020-21
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	17-05-21
Customer ID	:	PCC
Sample Type /Size	:	150X150X150 mm
Sample grade/Age	:	M15 / 28 Days Compressive Strength
Reference to BIS codes	:	IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5
Date of test	:	11/06/2021

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	PCC	M15	14/05/2021	11/06/2021	151.83 X 151.27 X 149.92	22967	8.633	392.1	17.1	17.4
2	PCC	M15	14/05/2021	11/06/2021	151.27 X 151.02 X 150.36	22846	8.994	399.4	17.5	
3	PCC	M15	14/05/2021	11/06/2021	150.60 X 151.66 X 151.76	22841	8.399	404.1	17.7	

* The results obtained are satisfactory as per standard requirements.

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R KARTHIK RECHAN
Authorized Signatory
Quality Manager

AEE (VRP) SD

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M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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TEST RESULTS OF GRADATION FOR WMM

Lab ID : **CP-RW-2022-01-29-38** **Date: 19-05-21**

Customer : Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.

Address : Vidyaranyapura Sub Division, BBMP, Bangalore.

Project Name : Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)

Agency : Sri.N M Shivakumar, No.7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010

Customer Reference : BBMP/EE/BTP/WO/204/2020-21

Source of Sample : Sample supplied by Agency

Sample Condition : Satisfactory

Date of Receipt : 17-05-21

Type of Mix : WMM (Wet Mix Macadam)

Date of Test : 17-05-21

Oven Dry Weight : 10500 Grams

IS Sieve Size(mm)	Weight Retained (gm)	Cumulative Weight Retained (gm)	% Cumulative Weight Retained	% Passing	Spec.I.Vide Table 400.13 MORTH Specification
53	0	0	0.0	100.0	100
45	298	298	2.8	97.2	95-100
22.4	2078	2376	22.6	77.4	60-80
11.2	2314	4690	44.7	55.3	40-60
4.75	2098	6788	64.6	35.4	25-40
2.36	1987	8775	83.6	16.4	15-30
0.6	547	9322	88.8	11.2	8-22
0.075	678	10000	95.2	4.8	0-5

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R KARTHIK RECHAN
Authorized Signatory
Quality Manager

AEE (WRP) SD

M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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TEST REPORT OF AGGEGRATE IMPACT VALUE
IS: 2386 Part IV

Lab ID	:	**CP-RW-2022-01-29-38** **Date: 19-05-21**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)
Agency	:	Sri.N M Shivakumar, No.7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010
Customer Reference	:	BBMP/EE/BTP/WO/204/2020-21
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	17-05-21
Type of Mix	:	Coarse Aggregate for WMM (Wet Mix Macadam)
Date of Test	:	17-05-21

Sl.No	Particulars of observations	Index	TEST 1	TEST 2
1	Total weight of the surface dry sample sample (passing 12.5 mm and retained on 10mm sieve)	A	300.2	300.2
2	Weight of fraction passing 2.36mm sieve After giving 15 blows	B	73.9	74.0
3	weight of fraction retained 2.36mm sieve After giving 15 blows	C	225.9	225.8
4	Total weight of (B+C) is less than the initial weight (Weight A) by more than one gram the result shall be discarded and a fresh test made.	A-(B+C)	0.4	0.4
5	Aggregate impact value	(B/A)*100	24.6	24.7
6	Aggregate impact value (Mean of two tests)	Pecentage	24.6	

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FOR CIVIL Pro.
R HARTHIK RECHAN
Authorized Signatory
Quality Manager

AEE (VP)

End of Report

M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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Certificate No : [illegible]

DETERMINATION OF FLAKINESS INDEX AND ELONGATION INDEX OF COARSE AGGREGATE(IS 2386 (Part I) 1963 (RA 2007)

Lab ID	:	**CP-RW-2022-01-29-38** **Date:** 19-05-21
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)
Agency	:	Sri.N M Shivakumar, No 7, 2nd Block, Jaganahalli, Rajajinagara, Bangalore-560010
Customer Reference	:	BBMP/EE/BTP/WO/204/2020-21
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	17-05-21
Type of Mix	:	Coarse Aggregate for WMM (Wet Mix Macadam)
Date of Test	:	17-05-21

Result:

Index	Percentage of Flakiness and Elongation Index	Secified limits as per MORTH specification table 400-12
Flakiness Index	12.8%	Combined Flakiness & Elongation Index for WMM is Maximum 35%
Elongation Index	12.5%	
Combined Flakiness and Elongation Index for WMM	25.3%	

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R EARTHIK RECHAN
Authorized Signatory
Quality Manager

AEE (VRP) SD

M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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DETERMINATION OF FLAKINESS INDEX AND ELONGATION INDEX OF COARSE AGGREGATE(IS 2386 (Part 1) 1963 (RA 2007)

Lab ID	:	**CP-RW-2022-01-29-38** **Date: 19-05-21**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)
Agency	:	Sri.N M Shivakumar, No.7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010
Customer Reference	:	BBMP/EE/BTP/WO/204/2020-21
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	17-05-21
Type of Mix	:	Coarse Aggregate for WMM (Wet Mix Macadam)
Date of Test	:	17-05-21

Result:

Index	Percentage of Flakiness and Elongation Index	Secified limits as per MORTH specification table 400-12
Flakiness Index	12.8%	Combined Flakiness & Elongation Index for WMM is Maximum 35%
Elongation Index	12.5%	
Combined Flakiness and Elongation Index for WMM	25.3%	

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R KARTHIK RECHAN
Authorized Signatory
Quality Manager

AEE (VRP) SD

M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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DETERMINATION OF FLAKINESS INDEX AND ELONGATION INDEX OF COARSE AGGREGATE(IS 2386 (Part 1) 1963 (RA 2007)

Lab ID	:	**CP-RW-2022-01-29-38** **Date: 19-05-21**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)
Agency	:	Sri.N M Shivakumar, No.7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010
Customer Reference	:	BBMP/EE/BTP/WO/204/2020-21
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	17-05-21
Type of Mix	:	Coarse Aggregate for WMM (Wet Mix Macadam)
Date of Test	:	17-05-21

Result:

Index	Percentage of Flakiness and Elongation Index	Secified limits as per MORTH specification table 400-12
Flakiness Index	12.8%	Combined Flakiness & Elongation Index for WMM is Maximum 35%
Elongation Index	12.5%	
Combined Flakiness and Elongation Index for WMM	25.3%	

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DETERMINATION OF FLAKINESS INDEX AND ELONGATION INDEX OF COARSE AGGREGATE(IS 2386 (Part 1) 1963 (RA 2007)

Lab ID	:	**CP-RW-2022-01-29-38** **Date: 19-05-21**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)
Agency	:	Sri.N M Shivakumar, No.7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010
Customer Reference	:	BBMP/EE/BTP/WO/204/2020-21
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	17-05-21
Type of Mix	:	Coarse Aggregate for WMM (Wet Mix Macadam)
Date of Test	:	17-05-21

Result:

Index	Percentage of Flakiness and Elongation Index	Secified limits as per MORTH specification table 400-12
Flakiness Index	12.8%	Combined Flakiness & Elongation Index for WMM is Maximum 35%
Elongation Index	12.5%	
Combined Flakiness and Elongation Index for WMM	25.3%	

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R KARTHIK RECHAN
Authorized Signatory
Quality Manager

AEE (VRP) SD

M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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TEST RESULTS OF GRADATION FOR DBM
(IS 2386:(Part 1) 1963 (RA2011)

Lab ID	:	**CP-RW-2022-01-29-38** **Date: 03-06-21**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)
Agency	:	Sri.N M Shivakumar, No.7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010
Customer Reference	:	BBMP/EE/BTP/WO/204/2020-21
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	01-06-21
Type of Mix	:	DBM-Plant (Dense Bituminous Macadam)
Date of Test	:	01-06-21
Weight of Sample	:	5000 Grams

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Specification Limits as per MORTH specification Table 500-10 (grading -2)
37.5	0	0	0	100	100
26.5	172	172	3.44	96.56	90-100
19	1013	1185	23.70	76.30	71-95
13.2	520	1705	34.10	65.90	56-80
4.75	1150	2855	57.10	42.90	38-54
2.36	680	3535	70.70	29.30	28-42
0.3	950	4485	89.70	10.30	7-21
0.075	272	4757	95.14	4.86	2-8
PAN	243	5000	0.00	0	0

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Authorized Signatory
Quality Manager

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M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com
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PHYSICAL REQUIREMENTS FOR COARSE AGGREGATE FOR DENSE BITUMINOUS MACADAM

Lab ID	:	**CP-RW-2022-01-29-38** **Date: 04-06-21**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)
Agency	:	Sri.N M Shivakumar, No.7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010
Customer Reference	:	BBMP/EE/BTP/WO/204/2020-21
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	01-06-21
Type of Mix	:	DBM (Dense Bituminous Macadam)
Date of Test	:	01-06-21

Table 500-6 : Physical Requirements fo Coarse Aggregate for Dense Bituminous Macadam

Property	Test	Result	Specification	Method of Test
Partical Shape	Flakiness Index	13.5	Combined Flakiness & Elongation Index for DBM is Maximum 35%	IS:2386 Part I
	Elongation Index	14.8		
Strength	Aggregate Impact Value	23.6	Maximum 30%	IS:2386 Part IV
Specific gravity	Specific gravity	2.2	Maximum 2.7	IS:2386 Part III
Water Absorption	Water Absorption	1.4	Maximum 2%	IS:2386 Part III

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R KARTHIK RECHAN
Authorized Signatory
Quallity Manager

AEE (WRM) SO

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M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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TESTS RESULTS ON STABILITY OF MIX

Lab ID	:	**CP-RW-2022-01-29-38** **Date: 04-06-21**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)
Agency	:	Sri.N M Shivakumar, No.7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010
Customer Reference	:	BBMP/EE/BTP/WO/204/2020-21
Source of Sample	:	Hot Mix Plant, Bangalore
Sample Condition	:	Satisfactory
Date of Receipt	:	01-06-21
Type of Mix	:	DBM (Dense Bituminous Mecadam)
Date of Test	:	01-06-21

The results of the tests conducted on the Dense Bituminous Macadam mix sample are as follow

Sl.No	Particulars of observations	TEST 1	TEST 2	Secified limits as per MORTH specification table 500-11
1	Marshal Stability at 60°C, KN	11.59	11.82	9KN(Min)
2	Marshal flow at 60°C, mm	3.56	3.87	2-4
3	Percent air Voids	4.52	4.17	3-5
4	Percent Voids in mineral Aggregate(VMA %)	14.54	14.76	13-15
5	Percent Voids filled with Bitumen(VFB %)	68.98	70.28	65-75
6	Density, g/cc	2.42	2.40	–

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R KARTHIK RECHAN
Authorized Signatory
Quality Manager

End of Report

M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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TEST REPORT OF AGGEGRATE STRIPPING VALUE OF ROAD AGGRGATE (IS:6241)

Lab ID : **CP-RW-2022-01-29-38** **Date: 04-06-21**

Customer : Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.

Address : Vidyaranyapura Sub Division, BBMP, Bangalore.

Project Name : Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)

Agency : Sri.N M Shivakumar, No.7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010

Customer Reference : BBMP/EE/BTP/WO/204/2020-21

Source of Sample : Sample supplied by Agency

Sample Condition : Satisfactory

Date of Receipt : 01-06-21

Type of Mix : DBM(Dense Bitumnous Macadam)

Date of Test : 01-06-21

Type of Binder : 60/70

% of Binder Used : 5.0%

Weight of Aggregate : 200.0 gm

Weight of Binder : 10.0 gm

Temperature of water bath : 40°C

No of test	Retained Stripping Percentage	Stripping Percentage	Average Retained Stripping Percentage	Secified limits as per MORTH specification table 500-8
1	98.0	2.0	98.2	Minimum Retained Coating 95%
2	98.5	1.5		
3	98.0	2.0		

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R KARTHIK RECHAN
Authorized Signatory
Quality Manager

AEE (VRP) SD

****End of Report****

M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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TEST RESULTS OF BITUMEN BINDAR CONTENT AND GRADATION FOR DBM
(IS 2386:(Part 1) 1963 (RA2011)

Lab ID	:	**CP-RW-2022-01-29-38**	**Date: 15-06-21**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.	
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.	
Project Name	:	Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)	
Agency	:	Sri.N M Shivakumar, No.7, 2nd Block, Jaganahalli, Rajajinagara, Bangalore-560010	
Customer Reference	:	BBMP/EE/BTP/W.O/204/2020-21	
Source of Sample	:	Sample supplied by Agency	
Date of Receipt	:	14-06-21	
Type of Mix	:	DBM (Dense Bituminous Macadam)	
Date of Test	:	14-06-21	

Sl.no	Description	Index	Trail 1	Trail 2
1	Weight of the Sample	A	500	500
2	Weight of the sample After extraction	B	475	476
3	Bitumen percentage	$\frac{A-B}{A} \times 100$	5.0	4.8
4	Average percentage	%	4.9	

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Authorized Signatory
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AEE (VRP) SD

M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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Lab ID : **CP-RW-2022-01-29-38** **Date: 15-06-21**

AFTER EXTRACTION(Trail-1)

Weight of Sample(gm) : 475

IS Sieve Size(mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Specification Limits as per MORTH specification Table 500-10(grading -2)
37.5	0	0	0.0	100.0	100
26.5	45	45	9.5	90.5	90-100
19	47	92	19.4	80.6	71-95
13.2	47	139	29.2	70.8	56-80
4.75	150	289	60.7	39.3	38-54
2.36	35	324	68.1	31.9	28-42
0.3	65	389	81.8	18.2	7-21
0.075	72	461	96.9	3.1	2-8

AFTER EXTRACTION(Trail-2)

Weight of Sample(gm) : 476

IS Sieve Size(mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Specification Limits as per MORTH specification Table 500-10(grading -2)
37.5	0	0	0.0	100.0	100
26.5	42	42	8.8	91.2	90-100
19	48	90	18.9	81.1	71-95
13.2	15	105	22.1	77.9	56-80
4.75	150	255	53.6	46.4	38-54
2.36	74	329	69.1	30.9	28-42
0.3	55	384	80.7	19.3	7-21
0.075	75	459	96.4	3.6	2-8

* The results obtained are satisfactory as per standard requirements.

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Authorized Signatory
Quality Manager

AEE (VAP) SD

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M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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TEST RESULTS OF GRADATION FOR BC
IS 2386 (Part 1) 1963 (RA 2007)

Lab ID : **CP-RW-2022-01-29-38** **Date: 09-06-21**

Customer : Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore

Address : Vidyaranyapura Sub Division, BBMP, Bangalore.

Project Name : Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)

Agency : Sri.N M Shivakumar, No.7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010

Customer Reference : BBMP/EE/BTP/WO/204/2020-21

Source of Sample : Sample supplied by Agency

Sample Condition : Satisfactory

Date of Receipt : 07-06-21

Type of Mix : BC-Plant (Bituminous Concrete)

Date of Test : 07-06-21

Oven Dry Weight : 5000 Grams

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-17(grading-2)
19	0	0	0.0	100.0	100
13.2	21	21	0.4	99.6	90-100
9.5	688	709	14.2	85.8	70-88
4.75	1224	1933	38.7	61.3	53-71
2.36	799	2732	54.6	45.4	42-58
1.18	379	3111	62.2	37.8	34-48
0.6	349	3460	69.2	30.8	26-38
0.3	489	3949	79.0	21.0	18-28
0.15	401	4350	87.0	13.0	12-20
0.075	428	4778	95.6	4.4	4-10
PAN	222	5000	100	0.0	0

* The results obtained are satisfactory as per standard requirements.

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PHYSICAL REQUIREMENTS FOR COARSE AGGREGATE FOR BITUMINOUS CONCRETE

Date: 10-06-21

Lab ID	:	**CP-RW-2022-01-29-38**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)
Agency	:	Sri.N M Shivakumar, No.7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010
Customer Reference	:	BBMP/EE/BTP/WO/204/2020-21
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	07-06-21
Type of Mix	:	BC (Bituminous Concrete)
Date of Test	:	07-06-21

Table 500-16 : Physical Requirements fo Coarse Aggregate for Bituminous Concrete

Property	Test	Result	Specification	Method of Test
Partical Shape	Flakiness Index	10.7	Combined Flakiness & Elongation Index for BC is Maximum 35%	IS:2386 Part I
	Elongation Index	11.7		
Strength	Aggregate Impact Value	22.6	Maximum 24%	IS:2386 Part IV
Specific gravity	Specific gravity	2.54	Maximum 2.7	IS:2386 Part III
Water Absorption	Water Absorption	0.32	Maximum 2%	IS:2386 Part III

* The results obtained are satisfactory as per standard requirements.

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R KARTHIK RECHAN
Authorized Signatory
Quallity Manager

AEE (VRP) SD

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M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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TESTS RESULTS ON STABILITY OF MIX

Lab ID : **CP-RW-2022-01-29-38** **Date: 10-06-21**

Customer : Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.

Address : Vidyaranyapura Sub Division, BBMP, Bangalore.

Project Name : Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09

Agency : Sri.N M Shivakumar, No.7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010

Customer Reference : BBMP/EE/BTP/WO/204/2020-21

Source of Sample : Hot Mix Plant, Bangalore

Sample Condition : Satisfactory

Date of Receipt : 07-06-21

Type of Mix : BC (Bituminous Concrete)

Date of Test : 07-06-21

The results of the tests conducted on the Bituminous Concrete mix sample are as follow

Sl.No	Particulars of observations	TEST 1	TEST 2	Secified limits as per MORTH specification table 500-11
1	Marshal Stability at 60°C, KN	11.76	11.63	10KN(min)
2	Marshal flow at 60°C, mm	3.72	3.65	2-4
3	Percent air Voids	4.98	4.85	3-5
4	Percent Voids in mineral Aggregate(VMA %)	14.77	14.89	13-15
5	Percent Voids filled with Bitumen(VFB %)	72.75	72.63	65-75
6	Density, g/cc	2.28	2.26	–

* The results obtained are satisfactory as per standard requirements.

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R KARTHIK RECHAN
Authorized Signatory
Quality Manager

AEE (VRP) SD

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M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com
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TEST RESULTS OF BITUMEN BINDAR CONTENT AND GRADATION FOR BC
IS 2386 (Part 1) 1963 (RA 2011)

Lab ID : **CP-RW-2022-01-29-38** **Date: 17-06-21**

Customer : Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore

Address : Vidyaranyapura Sub Division, BBMP, Bangalore

Project Name : Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)

Agency : Sri N M Shivakumar, No 7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010

Customer Reference : BBMP/EE/BTP/WO/204/2020-21

Source of Sample : Sample supplied by Agency

Date of Receipt : 16-06-21

Type of Mix : BC (Bituminous Concrete)

Date of Test : 16-06-21

Sl.no	Description	Index	Trail 1	Trail 2
1	Weight of the Sample	A	500	500
2	Weight of the sample After extraction	B	471	473
3	Bitumen percentage	$\frac{A-B}{A} \times 100$	5.80	5.40
4	Average percentage	%	5.6	

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R KARTHIK RECHAN
Authorized Signatory
Quality Manager

AEE (VRP) SD

M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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Lab ID : **CP-RW-2022-01-29-38** **Date: 17-06-21**

AFTER EXTRACTION - Trail-1

Total Weight of the Sample(gm) : 471

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	5	5	1.1	98.9	90-100
9.5	99	104	22.1	77.9	70-88
4.75	103	207	43.9	56.1	53-71
2.36	51	258	54.8	45.2	42-58
1.18	26	284	60.3	39.7	34-48
0.6	21	305	64.8	35.2	26-38
0.3	53	358	76.0	24.0	18-28
0.15	38	396	84.1	15.9	12-20
0.075	42	438	93.0	7.0	4-10

AFTER EXTRACTION - Trail-2

Total Weight of the Sample(gm) : 473

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	8	8	1.7	98.3	90-100
9.5	101	109	23.0	77.0	70-88
4.75	106	215	45.5	54.5	53-71
2.36	53	268	56.7	43.3	42-58
1.18	25	293	61.9	38.1	34-48
0.6	23	316	66.8	33.2	26-38
0.3	54	370	78.2	21.8	18-28
0.15	32	402	85.0	15.0	12-20
0.075	31	433	91.5	8.5	4-10

* The results obtained are satisfactory as per standard requirements.

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R KARTHIK RECHAN
Authorized Signatory
Quality Manager

AEE (VRP) SD

M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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Format No: CP/TF/01

TEST REPORT ON BITUMEN

Lab ID : **CP-RW-2022-01-29-38** **Date: 26-05-21**

Customer : Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.

Address : Vidyaranyapura Sub Division, BBMP, Bangalore.

Project Name : Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)

Agency : Sri.N M Shivakumar, No.7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010

Customer's Reference : BBMP/EE/BTP/WO/204/2020-21

Source of Sample : Sample supplied by Agency

Sample Condition : Satisfactory

Date of Receipt : 24-05-21

Sample Type : Bitumen

Reference to BIS codes : IS: 1201-1220(1978) (Reaffirmed-2004)

Date of Test : 24-05-21

Test Results

Sl.no	Name of Test	Result	Requirements as per IS:73-2013
1	Penetration at 25°C , in 1/10th mm	**68**	60 to 70
2	Softening Point, °C	**45.2**	Min. 40°C
3	Ductility, cm	**93**	Min. 75cm
4	Flash point, °C	**230**	Min. 220°C
	Fire point, °C	**241**	

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Quality Manager

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DETERMINATION OF RATE OF SPREAD TACK COAT

Lab ID : **CP-RW-2022-01-29-38** **Date: 17-06-21**

Customer : Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.

Address : Vidyaranyapura Sub Division, BBMP, Bangalore.

Project Name : Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09

Agency : Sri.N M Shivakumar, No.7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010

Customer Reference : BBMP/EE/BTP/WO/204/2020-21

Sample Condition : Satisfactory

Date of Receipt : 16-06-21

Type of Mix : Tack coat

Date of Test : 16-06-21

Sl.No	Determination	Unit	TEST 1	TEST 2
1	Size of Plate (mxm)	Mt	0.30 x .30	0.30 x .30
2	Area of Plate (a)	Sq mtr	0.09	0.09
3	Initial Wt of empty Plate (b)	Kg	0.78	0.748
4	Final weight of plate after application of tack Coat (c)	Kg	0.803	0.771
5	Weight of tack Coat (d=c-b)	Kg	0.023	0.023
6	Rate of spread of tack coat	Kg/sq.m	0.256	0.256
7	Average	Kg/sq.m	0.256	
8	Specified Limit	Kg/sq.m	0.250 Kg/sq.m	

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R KARTHIK RECHAN
Authorized Signatory
Quality Manager

AEE (VRP) SD

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M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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TEST RESULTS OF GRADATION FOR WMM

Lab ID : **CP-RW-2022-01-29-38** **Date: 19-01-22**

Customer : Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.

Address : Vidyaranyapura Sub Division, BBMP, Bangalore.

Project Name : Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)

Agency : Sri.N M Shivakumar, No.7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010

Customer Reference : BBMP/EE/BTP/WO/204/2020-21

Source of Sample : Sample supplied by Agency

Sample Condition : Satisfactory

Date of Receipt : 17-01-22

Type of Mix : WMM (Wet Mix Macadam)

Date of Test : 17-01-22

Oven Dry Weight : 10500 Grams

IS Sieve Size(mm)	Weight Retained (gm)	Cumulative Weight Retained (gm)	% Cumulative Weight Retained	% Passing	Spec.I.Vide Table 400.13 MORTH Specification
53	0	0	0.0	100.0	100
45	298	298	2.8	97.2	95-100
22.4	2078	2376	22.6	77.4	60-80
11.2	2314	4690	44.7	55.3	40-60
4.75	2098	6788	64.6	35.4	25-40
2.36	1987	8775	83.6	16.4	15-30
0.6	547	9322	88.8	11.2	8-22
0.075	678	10000	95.2	4.8	0-5

* The results obtained are satisfactory as per standard requirements.

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R KARTHIK RECHAN
Authorized Signatory
Quality Manager

M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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TEST REPORT OF AGGEGRATE IMPACT VALUE
IS: 2386 Part IV

Lab ID	:	**CP-RW-2022-01-29-38**	**Date: 19-01-22**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.	
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.	
Project Name	:	Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)	
Agency	:	Sri.N M Shivakumar, No.7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010	
Customer Reference	:	BBMP/EE/BTP/WO/204/2020-21	
Source of Sample	:	Sample supplied by Agency	
Sample Condition	:	Satisfactory	
Date of Receipt	:	17-01-22	
Type of Mix	:	Coarse Aggregate for WMM (Wet Mix Macadam)	
Date of Test	:	17-01-22	

Sl.No	Particulars of observations	Index	TEST 1	TEST 2
1	Total weight of the surface dry sample sample (passing 12.5 mm and retained on 10mm sieve)	A	300.2	300.2
2	Weight of fraction passing 2.36mm sieve After giving 15 blows	B	73.9	74.0
3	weight of fraction retained 2.36mm sieve After giving 15 blows	C	225.9	225.8
4	Total weight of (B+C) is less than the initial weight (Weight A) by more than one gram the result shall be discarded and a fresh test made.	A-(B+C)	0.4	0.4
5	Aggregate impact value	(B/A)*100	24.6	24.7
6	Aggregate impact value (Mean of two tests)	Pecentage	24.6	

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R KARTHIK RECHAN
Authorized Signatory
Quality Manager

M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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DETERMINATION OF FLAKINESS INDEX AND ELONGATION INDEX OF COARSE AGGREGATE(IS 2386 (Part I) 1963 (RA 2007)

Lab ID	:	**CP-RW-2022-01-29-38** **Date: 19-01-22**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)
Agency	:	Sri.N M Shivakumar, No.7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010
Customer Reference	:	BBMP/EE/BTP/WO/204/2020-21
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	17-01-22
Type of Mix	:	Coarse Aggregate for WMM (Wet Mix Macadam)
Date of Test	:	17-01-22

Result:

Index	Percentage of Flakiness and Elongation Index	Secified limits as per MORTH specification table 400-12
Flakiness Index	12.8%	Combined Flakiness & Elongation Index for WMM is Maximum 35%
Elongation Index	12.5%	
Combined Flakiness and Elongation Index for WMM	25.3%	

* The results obtained are satisfactory as per standard requirements.

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R KARTHIK RECHAN
Authorized Signatory
Quality Manager

M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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TEST RESULTS OF GRADATION FOR DBM
(IS 2386:(Part 1) 1963 (RA2011)

Lab ID	:	**CP-RW-2022-01-29-38** **Date: 27-01-22**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)
Agency	:	Sri.N M Shivakumar, No.7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010
Customer Reference	:	BBMP/EE/BTP/WO/204/2020-21
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	24-01-22
Type of Mix	:	DBM-Plant (Dense Bituminous Macadam)
Date of Test	:	24-01-22
Weight of Sample	:	5000 Grams

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Specification Limits as per MORTH specification Table 500-10 (grading -2)
37.5	0	0	0	100	100
26.5	172	172	3.44	96.56	90-100
19	1013	1185	23.70	76.30	71-95
13.2	520	1705	34.10	65.90	56-80
4.75	1150	2855	57.10	42.90	38-54
2.36	680	3535	70.70	29.30	28-42
0.3	950	4485	89.70	10.30	7-21
0.075	272	4757	95.14	4.86	2-8
PAN	243	5000	0.00	0	0

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R KARTHIK RECHAN
Authorized Signatory
Quality Manager

M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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PHYSICAL REQUIREMENTS FOR COARSE AGGREGATE FOR DENSE BITUMINOUS MACADAM

Lab ID : **CP-RW-2022-01-29-38** **Date: 27-01-22**

Customer : Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.

Address : Vidyaranyapura Sub Division, BBMP, Bangalore.

Project Name : Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)

Agency : Sri.N M Shivakumar, No.7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010

Customer Reference : BBMP/EE/BTP/WO/204/2020-21

Source of Sample : Sample supplied by Agency

Sample Condition : Satisfactory

Date of Receipt : 24-01-22

Type of Mix : DBM (Dense Bituminous Macadam)

Date of Test : 24-01-22

Table 500-6 : Physical Requirements fo Coarse Aggregate for Dense Bituminous Macadam

Property	Test	Result	Specification	Method of Test
Partical Shape	Flakiness Index	13.5	Combined Flakiness & Elongation Index for DBM is Maximum 35%	IS:2386 Part I
	Elongation Index	14.8		
Strength	Aggregate Impact Value	23.6	Maximum 30%	IS:2386 Part IV
Specific gravity	Specific gravity	2.2	Maximum 2.7	IS:2386 Part III
Water Absorption	Water Absorption	1.4	Maximum 2%	IS:2386 Part III

* The results obtained are satisfactory as per standard requirements.

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Authorized Signatory
Quallity Manager

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M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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TESTS RESULTS ON STABILITY OF MIX

Lab ID	:	**CP-RW-2022-01-29-38** **Date: 27-01-22**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)
Agency	:	Sri.N M Shivakumar, No.7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010
Customer Reference	:	BBMP/EE/BTP/WO/204/2020-21
Source of Sample	:	Hot Mix Plant, Bangalore
Sample Condition	:	Satisfactory
Date of Receipt	:	24-01-22
Type of Mix	:	DBM (Dense Bituminous Mecadam)
Date of Test	:	24-01-22

The results of the tests conducted on the Dense Bituminous Macadam mix sample are as follow

Sl.No	Particulars of observations	TEST 1	TEST 2	Secified limits as per MORTH specification table 500-11
1	Marshal Stability at 60°C, KN	11.59	11.82	9KN(Min)
2	Marshal flow at 60°C, mm	3.56	3.87	2-4
3	Percent air Voids	4.52	4.17	3-5
4	Percent Voids in mineral Aggregate(VMA %)	14.54	14.76	13-15
5	Percent Voids filled with Bitumen(VFB %)	68.98	70.28	65-75
6	Density, g/cc	2.42	2.40	–

* The results obtained are satisfactory as per standard requirements.

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TEST REPORT OF AGGEGRATE STRIPPING VALUE OF ROAD AGGRGATE (IS:6241)

Lab ID : **CP-RW-2022-01-29-38** **Date: 27-01-22**

Customer : Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.

Address : Vidyaranyapura Sub Division, BBMP, Bangalore.

Project Name : Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)

Agency : Sri.N M Shivakumar, No.7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010

Customer Reference : BBMP/EE/BTP/WO/204/2020-21

Source of Sample : Sample supplied by Agency

Sample Condition : Satisfactory

Date of Receipt : 24-01-22

Type of Mix : DBM(Dense Bitumnous Macadam)

Date of Test : 24-01-22

Type of Binder : 60/70

% of Binder Used : 5.0%

Weight of Aggregate : 200.0 gm

Weight of Binder : 10.0 gm

Temperature of water bath : 40°C

No of test	Retained Stripping Percentage	Stripping Percentage	Average Retained Stripping Percentage	Secified limits as per MORTH specification table 500-8
1	98.0	2.0	98.2	Minimum Retained Coating 95%
2	98.5	1.5		
3	98.0	2.0		

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TEST RESULTS OF BITUMEN BINDAR CONTENT AND GRADATION FOR DBM
(IS 2386:(Part 1) 1963 (RA2011)

Lab ID	:	**CP-RW-2022-01-29-38** **Date: 28-01-22**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)
Agency	:	Sri.N M Shivakumar, No.7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010
Customer Reference	:	BBMP/EE/BTP/WO/204/2020-21
Source of Sample	:	Sample supplied by Agency
Date of Receipt	:	28-01-22
Type of Mix	:	DBM (Dense Bituminous Macadam)
Date of Test	:	28-01-22

Sl.no	Description	Index	Trail 1	Trail 2
1	Weight of the Sample	A	500	500
2	Weight of the sample After extraction	B	475	476
3	Bitumen percentage	$\frac{A-B}{A} \times 100$	5.0	4.8
4	Average percentage	%	4.9	

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Authorized Signatory
Quality Manager

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Lab ID : CP-RW-2022-01-29-38 Date: 28-01-22

AFTER EXTRACTION(Trail-1)

Weight of Sample(gm) : 475

IS Sieve Size(mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Specification Limits as per MORTH specification Table 500-10(grading -2)
37.5	0	0	0.0	100.0	100
26.5	45	45	9.5	90.5	90-100
19	47	92	19.4	80.6	71-95
13.2	47	139	29.2	70.8	56-80
4.75	150	289	60.7	39.3	38-54
2.36	35	324	68.1	31.9	28-42
0.3	65	389	81.8	18.2	7-21
0.075	72	461	96.9	3.1	2-8

AFTER EXTRACTION(Trail-2)

Weight of Sample(gm) : 476

IS Sieve Size(mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Specification Limits as per MORTH specification Table 500-10(grading -2)
37.5	0	0	0.0	100.0	100
26.5	42	42	8.8	91.2	90-100
19	48	90	18.9	81.1	71-95
13.2	15	105	22.1	77.9	56-80
4.75	150	255	53.6	46.4	38-54
2.36	74	329	69.1	30.9	28-42
0.3	55	384	80.7	19.3	7-21
0.075	75	459	96.4	3.6	2-8

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TEST RESULTS OF GRADATION FOR BC
IS 2386 (Part 1) 1963 (RA 2007)

Lab ID	:	**CP-RW-2022-01-29-38** **Date: 27-01-22**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)
Agency	:	Sri.N M Shivakumar, No.7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010
Customer Reference	:	BBMP/EE/BTP/WO/204/2020-21
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	24-01-22
Type of Mix	:	BC-Plant (Bituminous Concrete)
Date of Test	:	24-01-22
Oven Dry Weight	:	5000 Grams

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-17(grading-2)
19	0	0	0.0	100.0	100
13.2	21	21	0.4	99.6	90-100
9.5	688	709	14.2	85.8	70-88
4.75	1224	1933	38.7	61.3	53-71
2.36	799	2732	54.6	45.4	42-58
1.18	379	3111	62.2	37.8	34-48
0.6	349	3460	69.2	30.8	26-38
0.3	489	3949	79.0	21.0	18-28
0.15	401	4350	87.0	13.0	12-20
0.075	428	4778	95.6	4.4	4-10
PAN	222	5000	100	0.0	0

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TEST REPORT OF AGGEGRATE STRIPPING VALUE OF ROAD AGGRGATE (IS:6241)

Lab ID	:	**CP-RW-2022-01-29-38** **Date: 27-01-22**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)
Agency	:	Sri.N M Shivakumar, No.7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010
Customer Reference	:	BBMP/EE/BTP/WO/204/2020-21
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	24-01-22
Type of Mix	:	BC(Bitumenous Concrete)
Date of Test	:	24-01-22

Type of Binder	:	60/70
% of Binder Used	:	5.0%
Weight of Aggregate	:	200.0 gm
Weight of Binder	:	10.0 gm
Temperature of water bath	:	40°C

No of test	Retained Stripping Percentage	Stripping Percentage	Average Retained Stripping Percentage	Secified limits as per MORTH specification table 500-8
1	97.5	2.5	98.0	Minimum Retained Coating 95%
2	98.0	2.0		
3	98.5	1.5		

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M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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PHYSICAL REQUIREMENTS FOR COARSE AGGREGATE FOR BITUMINOUS CONCRETE

Lab ID	:	**CP-RW-2022-01-29-38** **Date: 27-01-22**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)
Agency	:	Sri.N M Shivakumar, No.7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010
Customer Reference	:	BBMP/EE/BTP/WO/204/2020-21
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	24-01-22
Type of Mix	:	BC (Bituminous Concrete)
Date of Test	:	24-01-22

Table 500-16 : Physical Requirements fo Coarse Aggregate for Bituminous Concrete

Property	Test	Result	Specification	Method of Test
Partical Shape	Flakiness Index	10.7	Combined Flakiness & Elongation Index for BC is Maximum 35%	IS:2386 Part I
	Elongation Index	11.7		
Strength	Aggregate Impact Value	22.6	Maximum 24%	IS:2386 Part IV
Specific gravity	Specific gravity	2.54	Maximum 2.7	IS:2386 Part III
Water Absorption	Water Absorption	0.32	Maximum 2%	IS:2386 Part III

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M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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TESTS RESULTS ON STABILITY OF MIX

Lab ID	:	**CP-RW-2022-01-29-38** **Date: 27-01-22**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09
Agency	:	Sri.N M Shivakumar, No.7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010
Customer Reference	:	BBMP/EE/BTP/WO/204/2020-21
Source of Sample	:	Hot Mix Plant, Bangalore
Sample Condition	:	Satisfactory
Date of Receipt	:	24-01-22
Type of Mix	:	BC (Bituminous Concrete)
Date of Test	:	24-01-22

The results of the tests conducted on the Bituminous Concrete mix sample are as follow

Sl.No	Particulars of observations	TEST 1	TEST 2	Secified limits as per MORTH specification table 500-11
1	Marshal Stability at 60°C, KN	11.76	11.63	10KN(min)
2	Marshal flow at 60°C, mm	3.72	3.65	2-4
3	Percent air Voids	4.98	4.85	3-5
4	Percent Voids in mineral Aggregate(VMA %)	14.77	14.89	13-15
5	Percent Voids filled with Bitumen(VFB %)	72.75	72.63	65-75
6	Density, g/cc	2.28	2.26	–

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TEST RESULTS OF BITUMEN BINDAR CONTENT AND GRADATION FOR BC
IS 2386 (Part 1) 1963 (RA 2011)

Lab ID	:	**CP-RW-2022-01-29-38**	**Date: 28-01-22**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore	
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore	
Project Name	:	Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)	
Agency	:	Sri N M Shivakumar, No 7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010	
Customer Reference	:	BBMP/EE/BTP/WO/204/2020-21	
Source of Sample	:	Sample supplied by Agency	
Date of Receipt	:	28-01-22	
Type of Mix	:	BC (Bituminous Concrete)	
Date of Test	:	28-01-22	

Sl.no	Description	Index	Trail 1	Trail 2
1	Weight of the Sample	A	500	500
2	Weight of the sample After extraction	B	471	473
3	Bitumen percentage	$\frac{A-B}{A} \times 100$	5.80	5.40
4	Average percentage	%	5.6	

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Authorized Signatory
Quality Manager

M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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Lab ID : **CP-RW-2022-01-29-38** **Date: 28-01-22**

AFTER EXTRACTION - Trail-1

Total Weight of the Sample(gm) : 471

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	5	5	1.1	98.9	90-100
9.5	99	104	22.1	77.9	70-88
4.75	103	207	43.9	56.1	53-71
2.36	51	258	54.8	45.2	42-58
1.18	26	284	60.3	39.7	34-48
0.6	21	305	64.8	35.2	26-38
0.3	53	358	76.0	24.0	18-28
0.15	38	396	84.1	15.9	12-20
0.075	42	438	93.0	7.0	4-10

AFTER EXTRACTION - Trail-2

Total Weight of the Sample(gm) : 473

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	8	8	1.7	98.3	90-100
9.5	101	109	23.0	77.0	70-88
4.75	106	215	45.5	54.5	53-71
2.36	53	268	56.7	43.3	42-58
1.18	25	293	61.9	38.1	34-48
0.6	23	316	66.8	33.2	26-38
0.3	54	370	78.2	21.8	18-28
0.15	32	402	85.0	15.0	12-20
0.075	31	433	91.5	8.5	4-10

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TEST REPORT ON BITUMEN

Lab ID	:	**CP-RW-2022-01-29-38** **Date: 22-01-22**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09 (Vidyaranyapura)
Agency	:	Sri.N M Shivakumar, No.7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010
Customer's Reference	:	BBMP/EE/BTP/WO/204/2020-21
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	20-01-22
Sample Type	:	Bitumen
Reference to BIS codes	:	IS: 1201-1220(1978) (Reaffirmed-2004)
Date of Test	:	20-01-22

Test Results

Sl.no	Name of Test	Result	Requirements as per IS:73-2013
1	Penetration at 25°C , in 1/10th mm	**68**	60 to 70
2	Softening Point, °C	**45.2**	Min. 40°C
3	Ductility, cm	**93**	Min. 75cm
4	Flash point, °C	**230**	Min. 220°C
	Fire point, °C	**241**	

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M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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DETERMINATION OF RATE OF SPREAD TACK COAT

Lab ID : **CP-RW-2022-01-29-38** **Date: 28-01-22**

Customer : Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore

Address : Vidyaranyapura Sub Division, BBMP, Bangalore

Project Name : Improvements to Roads and Drains at HMT Layout 1st Block 2nd Block 3rd Block and Surrounding area in Ward No 09

Agency : Sri N M Shivakumar, No 7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010

Customer Reference : BBMP/EE/BTP/WO/204/2020-21

Sample Condition : Satisfactory

Date of Receipt : 28-01-22

Type of Mix : Tack coat

Date of Test : 28-01-22

SLNo	Determination	Unit	TEST 1	TEST 2
1	Size of Plate (mxm)	Mt	0.30 x .30	0.30 x .30
2	Area of Plate (a)	Sq.mtr	0.09	0.09
3	Initial Wt of empty Plate (b)	Kg	0.78	0.748
4	Final weight of plate after application of tack Coat (c)	Kg	0.803	0.771
5	Weight of tack Coat (d=c-b)	Kg	0.023	0.023
6	Rate of spread of tack coat	Kg/sq.m	0.256	0.256
7	Average	Kg/sq.m	0.256	
8	Specified Limit	Kg/sq.m	0.250 Kg/sq.m	

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